

# REVISION OF THE OSTRACODA FROM THE BARGATE BEDS IN SURREY

by P. KAYE

ABSTRACT. Nineteen species of ostracoda are described from the Bargate beds exposed south-west of Guildford. The type material from an earlier paper is revised and refigured. Two of the species are found to require renaming and five new species are described. Four forms are left under open nomenclature.

BRITISH Aptian ostracoda have been somewhat neglected in the past, reference to forms found in the Bargate beds near Guildford by Chapman (1894) being the major contribution. Chapman's type specimens which have been preserved at the Sedgwick Museum, Cambridge, are here revised and refigured. These specimens were collected by Chapman from two localities, the most prolific horizon being in Littleton Lane Quarry, 1 mile south-west of Guildford. He obtained additional specimens from a lane leading to Great Halfpenny Farm on the west side of St. Martha's Hill, Chilworth. Unfortunately, due to absence of exposures, I have not been able to re-sample Chapman's localities but a comparative fauna has been found in a sample taken from the mortuary pit at Compton during a Palaeontological Association field trip led by Dr. F. A. Middlemiss (27 April 1963). The coarse grain of the bulk of the Bargate beds is not conducive to ostracod preservation but a clay-rich lens preserved between two large calcareous concretions at Compton has yielded a well preserved assemblage.

The Bargate beds are noted for their derived fossils, particularly of Oxfordian and Kimmeridgian age, and it seemed possible that part of the ostracod fauna could be derived. This hypothesis was rejected on a basis of identical preservation of specimens of undescribed species and those of well-known Aptian age. The pyritic nature of the derived fossils as against the heavily calcified ostracod valves and indigenous brachiopods augmented this conclusion. Slight abrasion of the whole ostracod fauna had, however, occurred but this seemed consistent with the coarse nature of the deposit. The undescribed forms were each compared with earlier faunas and were found to be distinct from any species either described or detected. The author is grateful for the help of Mr. D. Barker of the Dept. of Geology, Leicester, for comparing the specimens with his Portlandian and Purbeckian material. In the preparation of this paper the author is most grateful to the Curator of the Sedgwick Museum, Cambridge, for the loan of Chapman's type specimens and to Professor P. Allen for encouragement and provision of facilities at Reading. I am also indebted to Mr. J. Watkins who undertook the photography of the specimens and produced the plates.

Chapman's type specimens are in the Sedgwick Museum at Cambridge (S.M.) whilst the author's types and comparative material are in the collection at the British Museum of Natural History (B.M.N.H.).

## SYSTEMATIC DESCRIPTIONS

Order PODOCOPIDA

Suborder PLATYCOPINA

Family CYTHERELLIDAE Sars 1866

Genus CYTHERELLOIDEA Alexander 1929

*Cytherelloidea* sp.

Plate 54, fig. 1

*Material.* Carapace B.M.N.H. Io1500 from the Bargate beds at Compton.

*Remarks.* Only a single specimen of this species has been found. This rather eroded carapace is, however, described because of its marked difference from other Cretaceous species and our lack of knowledge of the genus in the Aptian. The valves are rather similar to *Cytherelloidea williamsoniana* (Jones) in shape and degree of compression but the dorsal rib is absent. Only the long straight ventral rib which is connected posteriorly to the lower of two nodes is present. The lateral surface is faintly pitted. There is a low anterior marginal rib which is continued along the whole length of the ventral margin as a shelf.

Suborder PODOCOPINA

Superfamily BAIRDIACEA

Family BAIRDIIDAE Sars 1887

Genus BAIRDIA M<sup>c</sup>Coy 1844*Bairdia* sp.

Plate 54, fig. 3

*Material.* Carapace B.M.N.H. Io1506 from the Bargate beds at Compton.

*Remarks.* As species of this genus are rare in the British Lower Cretaceous this single specimen is thought worthy of description. The carapace is rather elongate with a comparatively low degree of arching of the dorsal margin. It is probably related to forms occurring in the Tealby series of Lincolnshire. The genus has not so far been found at any level in the Speeton Clay but occurs in the Upper Albian at a variety of localities.

Superfamily CYTHERACEA

Family CYTHERURIDAE Müller 1894

Genus CYTHERURA Sars 1866

*Cytherura reticulosa* (Chapman 1894)

Plate 55, figs. 7, 9

1894 *Cytheropteron reticulosum* Chapman, p. 692, pl. 33, fig. 6a-c.

*Material.* (i) Holotype, a left valve, Sedgwick Museum B 28837, from the Bargate Beds at Littleton. (ii) Eight specimens from the authors collection B.M.N.H. Io1549, 50, from the Tealby limestone at Nettleton, Lincolnshire.

*Measurements.*

L.V., B 28837, length 0.41 mm., height 0.22 mm.

R.V., Io1549 ,, 0.40 mm. ,, 0.25 mm.

*Remarks.* This characteristically ornamented species was found only as a single specimen by Chapman but is abundant in the Tealby Clays and Limestone series in Lincolnshire. The dominant features of the ornament are the series of longitudinal ribs crossing the medio-lateral surface. The ventral rib is more prominent and forms a strong spine posteriorly. Marginal areas are broad and crossed by a series of wavy radial pore canals. Hinge strong, crenulate, merodont. Right valves are shorter and rather more strongly arched dorsally due to the presence of a strong shelf above the median hinge element.

Genus CYTHEROPTERON Sars 1866

*Cytheropteron* (*C.*) *vesiculosum* (Chapman 1894)

Plate 55, figs. 1-3

1894 *Cythere vesiculosa* Chapman, p. 106, pl. 33, fig. 1a-c.

*Material.* (i) Holotype, a right valve, S.M. B 28815, from the Bargate beds at Littleton. (ii) A left valve B.M.N.H. Io1532, from the Bargate beds at Compton.

*Measurements.*

Holotype, R.V., B 28815, length 0.42 mm., height 0.22 mm.  
L.V., Io1532 ,, 0.48 mm. ,, 0.25 mm.

*Description.* Valves small, with prominent ventral alae. Dorsal and ventral margins straight and parallel; anterior margin subrectangular, posterior margin pointed at two-thirds height. Lateral surface covered with a series of nodulose swellings. A well-developed eye tubercle occurs antero-dorsally. The duplicature is broad and crossed by a few straight, simple radial pore canals. Hinge crenulate, merodont, consisting in the left valve of two strongly divided elongate sockets separated by a denticulate median bar. The terminal hinge elements in the holotype are unfortunately broken.

*Remarks.* The species is not a characteristic *Cytheropteron* but shows affinities in its shape, alae, marginal features, and hinge structure.

*Cytheropteron* (*Eocytheropteron*) *comptonense* nom. nov.

Plate 54, figs. 15, 16

non 1854 *Cythere laticristata* Bosquet, p. 118, pl. 7, fig. 11a-d.

1894 *Cytheropteron laticristatum* (Bosquet); Chapman, p. 692.

*Material.* (i) Holotype, a left valve, S.M. B 28836 from the Bargate beds at Littleton. (ii) A right valve and a broken carapace, B.M.N.H. Io1524, 25, from the Bargate beds at Compton.

*Diagnosis.* A species of *Cytheropteron* with prominent symmetrical ventral alate expansion and smooth lateral surface.

*Measurements.*

Holotype, L.V., B 28836, length 0.54 mm., height 0.34 mm.  
R.V., Io1524 ,, 0.55 mm. ,, 0.35 mm.

*Description.* Valves small, strongly inflated ventrally. Dorsal margin arched with the greatest height at one-third length. Ventral margin obscured by the ventral alate expansion. Lateral surface smooth. The hinge is unfortunately broken in all of the available

specimens but appears in the right valves to be a continuous row of crenulations highest at the ends.

*Remarks.* Chapman's original interpretation of this specimen is now found to be erroneous and a new name is required. The size and prominence of the ventral alae and lack of surface ornament make it distinct from other related species of the same sub-genus.

? *Cytheropteron costuliferum* Chapman 1894

1894 *Cytheropteron costuliferum* Chapman, p. 692, pl. 33, fig. 7a-c.

*Material.* A single closed carapace S.M. B 28838 from the Bargate beds at Littleton.

*Remarks.* As only this single carapace has been found, generic allocation is not possible. The strong ventral expansion of the valves makes them triangular in end view and the longitudinal striations along the lateral surface make the specimen quite unlike any other figured Cretaceous form.

Genus EUCYTHERURA Müller 1894

*Eucytherura chapmani* nom. nov.

Plate 55, fig. 4

non 1890 *Cythereis ornatissima reticulata* Jones and Hinde, p. 24, pl. 1, figs. 67, 68, 77; pl. 4, figs. 9-12.

1894 *Cythereis ornatissima reticulata* Jones and Hinde; Chapman, p. 689.

*Material.* Holotype, a right valve, S.M. B 28818, from the Bargate beds at Littleton.

EXPLANATION OF PLATE 54

All figures  $\times 50$ .

Fig. 1. *Cytherelloidea* sp., Aptian, Compton; carapace from right; B.M.N.H. Io1500.

Figs. 2, 4, 5. *Veenia robusta* sp. nov., Aptian, Compton. 2, Carapace (paratype), dorsal view; B.M.N.H. Io1502. 4, Right valve (paratype), lateral view; B.M.N.H. Io1503. 5, Left valve (holotype), lateral view; B.M.N.H. Io1501.

Fig. 3. *Bairdia* sp., Aptian, Compton; carapace from right; B.M.N.H. Io1506.

Figs. 6, 8, 9. *Cythereis cristata* nom. nov., Aptian. 6, Female left valve (holotype), lateral view; B 28816, Littleton. 8, Female left valve (holotype), internal view; B 28816, Littleton. 9, Male carapace from left; B.M.N.H. Io1507, Compton.

Figs. 7, 10. *Macrodentina* sp., Aptian, Compton. 7, Adult carapace from right; B.M.N.H. Io1509. 10, Juvenile right valve, lateral view; B.M.N.H. Io1510.

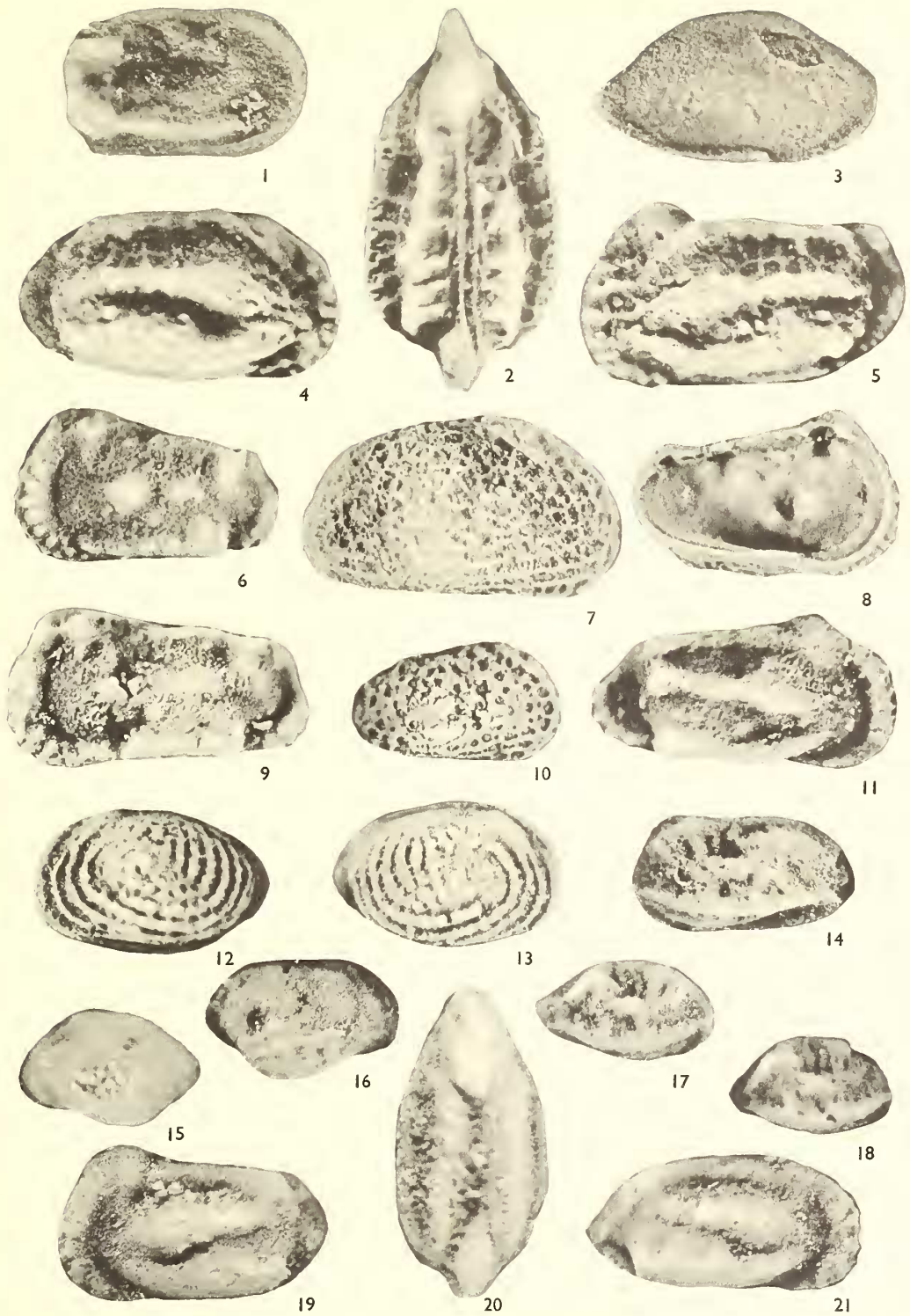
Fig. 11. *Cythereis angulata* sp. nov., Aptian, Compton; right valve (holotype), lateral view; B.M.N.H. Io1512.

Figs. 12, 13. *Neocythere (N.) vanveeni* Mertens, Aptian, Compton. 12, Adult carapace from left; B.M.N.H. Io1517. 13, Adult carapace from right; B.M.N.H. Io1518.

Figs. 14, 17, 18. *Pseudobythocythere vellicata* (Chapman), Aptian. 14, Male left valve, lateral view; B.M.N.H. Io1521, Compton. 17, Female right valve, lateral view; B.M.N.H. Io1522, Compton. 18, Female right valve (Chapman *C. bicarinata*), lateral view; B 28824, Littleton.

Figs. 15, 16. *Cytheropteron (Eocytheropteron) comptonense* nom. nov., Aptian. 15, Left valve (holotype), lateral view; B 28836, Littleton. 16, Right valve, lateral view; B.M.N.H. Io1524, Compton.

Figs. 19-21. *Protocythere inornata* sp. nov., Aptian, Compton. 19, Female left valve (holotype), lateral view; B.M.N.H. Io1526. 20, Male carapace, dorsal view; B.M.N.H. Io1527. 21, Female right valve, lateral view; B.M.N.H. Io1528.





*Diagnosis.* A small species of *Eucytherura* with a strong inflated ventral longitudinal rib, well-developed eye tubercle and marked anterior marginal rib.

*Measurements.*

Holotype, R.V., B 28818, length 0.40 mm., height 0.20 mm.

*Description.* Valves small, laterally compressed subrectangular in shape. Anterior margin rather truncate; dorsal and ventral margins straight and subparallel. A low anterior marginal rib connects dorsally with a prominent eye tubercle. An inflated ventral rib of constant height runs parallel to the margin. Postero-dorsally there is a longitudinally elongated nodular process. Three tubercles occur on the lower half of the anterior margin. Lateral surface finely pitted. The duplicature is broad and crossed by few, simple radial pore canals. The hinge is broken but appears to be smooth, merodont.

*Remarks.* The species differs considerably from *Cythereis reticulata* and Chapman's confusion is surprising. He does, however, state that the size is only half that of normal specimens. In shape *E. chapmani* is rather similar to the Albian form *E. rectangulata* Kaye and the Barremian form *E. neocomiana* Kaye. It differs in the possession of a strong inflated ventral rib and the lack of surface reticulation. It is nearest to *E. neocomiana* in shape and in the nature of the eye tubercle. *E. rectangulata* from the Albian possesses oblique ribs antero-laterally and is more closely related to *E. nettletonensis* described below.

*Eucytherura nettletonensis* sp. nov.

Plate 55, figs. 5, 6, 8

*Material.* (i) Holotype, a left valve B.M.N.H. Io1533 from the Tealby Limestone series at Nettleton, Lincolnshire (Horizon 2' above the second limestone band). (ii) Fifteen paratypes from the same sample B.M.N.H. Io1534-48.

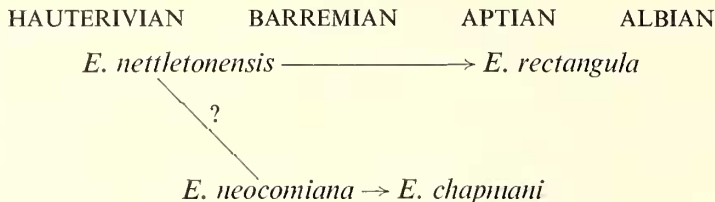
*Diagnosis.* A quadrangular species of *Eucytherura* with a short median longitudinal rib present antero-laterally and a marked eye tubercle. The prominent ventral longitudinal rib diverges from the margin anteriorly.

*Measurements.* Holotype, L.V., Io1533 length 0.35 mm., height, 0.21 mm.

*Description.* Valves small, compressed dorsally and laterally. Dorsal and ventral margins straight and parallel; anterior margin subquadrate, posterior margin rounded at two-thirds height. Antero-dorsally a large smooth eye tubercle is connected to the anterior margin by a short, swollen rib. A prominent ventral longitudinal rib follows the margin posteriorly but diverges anteriorly to meet the anterior margin at one-quarter height; below it antero-ventrally there is a narrow flat shelf. A short median longitudinal rib runs across the antero-lateral surface from the margin to terminate at one-quarter length. Postero-dorsally an irregular tubercle is connected by a short rib to the posterior margin. The lateral surface is strongly reticulate. The duplicature is broad and is crossed by few thick radial pore canals. A vestibule occurs anteriorly. The hinge is merodont with smooth terminal elements.

*Remarks.* This species though of Hauterivian age is described here because of its relationship to the other British Cretaceous species of the genus. *E. nettletonensis* is most closely

related to *E. rectangula* and is distinguished from the *E. chapmani*-*E. neocomiana* group by the lack of an anterior marginal rib and the presence of a median longitudinal rib. It differs from *E. rectangula* in the greater elongation, the smooth eye tubercle and the increased prominence of the ventral rib. A possible evolutionary sequence is:



Genus DOLOCYHERE Mertens 1956

*Dolocythere rara* Mertens 1956

Plate 55, figs. 12, 14, 15

non 1888 *Cytheridea retorrída* Jones and Sherborn, p. 260, pl. 1, fig. 8a-c.

1894 *Cytheridea retorrída* Jones and Sherborn; Chapman, p. 689.

1956 *Dolocythere rara* Mertens, p. 192, pl. 10, figs. 33-37; pl. 13, figs. 91-93.

*Material.* (i) A right valve S.M. B 28820 (Chapman *C. retorrída*) from Littleton. (ii) Four specimens from the author's collection B.M.N.H. Io1551-3, locality Compton.

*Measurements.*

R.V., B 28820, length 0.53 mm., height 0.24 mm.

L.V., Io1551 ,, 0.50 mm. ,, 0.25 mm.

R.V., Io1552 ,, 0.50 mm. ,, 0.25 mm.

*Remarks.* The specimen recorded by Chapman as *C. retorrída* is now seen to differ significantly from that species and belongs to *D. rara* Mertens.

EXPLANATION OF PLATE 55

All figures × 100.

Figs. 1-3. *Cytheropteron* (*C.*) *vesiculosum* (Chapman), Aptian. 1, Left valve, lateral view; B.M.N.H. Io1532, Compton. 2, Right valve (holotype), dorsal view; B 28815, Littleton. 3, Right valve (holotype), lateral view; B 28815, Littleton.

Fig. 4. *Eucytherura chapmani* nom. nov., Aptian, Littleton; right valve (holotype), lateral view; B 28818.

Figs. 5, 6, 8. *Eucytherura nettletonensis* sp. nov., Hauterivian, Nettleton. 5, Left valve (holotype), lateral view; B.M.N.H. Io1533. 6, Right valve (paratype), lateral view; B.M.N.H. Io1534. 8, Carapace (paratype), dorsal view; B.M.N.H. Io1535.

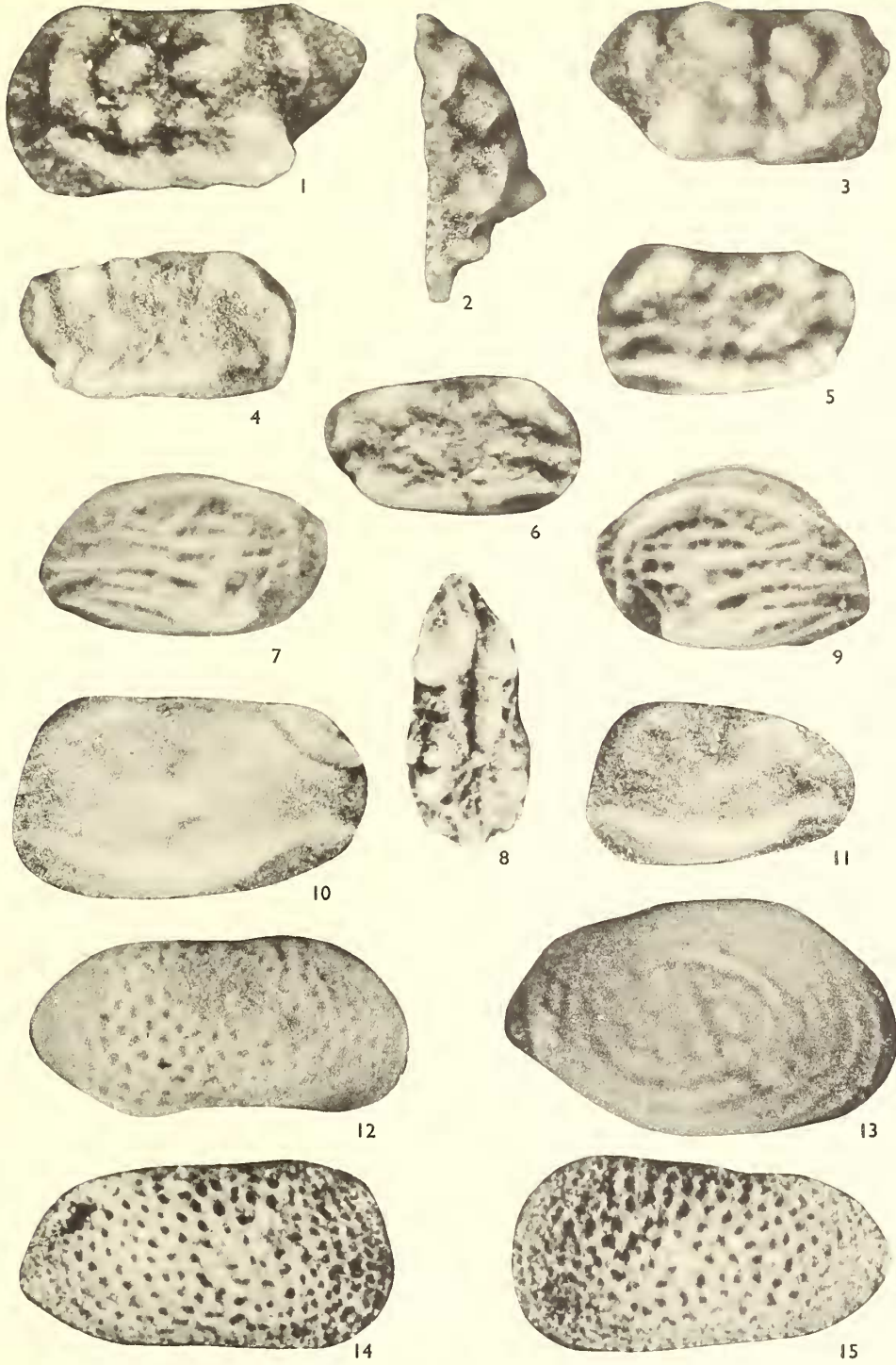
Figs. 7, 9. *Cytherura reticulosa* (Chapman). 7, Left valve (holotype), lateral view; B 28827, Aptian, Littleton. 9, Right valve, lateral view; B.M.N.H. Io1549, Hauterivian, Nettleton.

Figs. 10, 11. *Pseudocythera vellicata* (Chapman), Aptian, Littleton. 10, Juvenile left valve, lateral view; B 28828 (Chapman *C. vellicata*). 11, Juvenile left valve, lateral view; B 28829 (Chapman *C. fenestrata*).

Figs. 12, 14, 15. *Dolocythere rara* Mertens, Aptian. 12, Right valve, lateral view; B 28820, Littleton. 14, Right valve, lateral view; B.M.N.H. Io1551, Compton. 15, Left valve, lateral view; B.M.N.H. Io1552, Compton.

Fig. 13. *Neocythere* (*N.*) *vanveeni* Mertens, Aptian, Littleton; juvenile right valve, lateral view; B 28834.







## Genus PSEUDOBYTHOCYTHERE Mertens 1950

*Pseudobythocythere vellicata* (Chapman 1894)

Plate 54, figs. 14, 17, 18; Plate 55, figs. 10, 11

- non 1849 *Cythereis lonsdaleiana* Jones, p. 20, pl. 5, fig. 12a-c.  
 non 1888 *Cytheridea bicarinata* Jones and Sherborn, p. 272, pl. 4, figs. 9, 10.  
 1894 *Cythereis lonsdaleiana* Jones; Chapman, p. 689.  
 1894 *Cytheridea bicarinata* Jones and Sherborn; Chapman, p. 690.  
 1894 *Cytheridea vellicata* Chapman, p. 690, pl. 33, fig. 3a-c.  
 1894 *Cytheridea fenestrata* Chapman, p. 690, pl. 33, fig. 4.

*Material.* (i) An adult right valve (mounted as *C. bicarinata*) B 28824 from Littleton. (ii) A juvenile left valve (mounted as *C. lonsdaleiana*) B 28819 from Littleton. (iii) An adult left valve (figured as *C. vellicata*) B 28828 from Littleton. (iv) A juvenile left valve (figured as *C. fenestrata*) B 28829 from Littleton. (v) Three juvenile left valves (mounted and figured as *C. bicarinata* var. *nodulosa*) B 28825-7 from Littleton. (vi) Five specimens from the author's collection B.M.N.H. Io1521-3, locality Compton.

*Measurements.*

R.V., B 28824,	length 0.49 mm.,	height 0.29 mm.
L.V., B 28828	„ 0.48 mm.	„ 0.28 mm.
L.V., B 28819	„ 0.40 mm.	„ 0.22 mm.
Male, L.V. Io1521	„ 0.60 mm.	„ 0.30 mm.
Female, R.V. Io1522	„ 0.50 mm.	„ 0.27 mm.

*Description.* Valves elongate with straight subparallel dorsal and ventral margins in the left valves and arched dorsal margin in the right valves. A high, keel-like rib runs in a convex arc above the ventral margin, it reaches the margin anteriorly and is connected posteriorly to the median rib. This latter rib parallels the ventral rib but becomes indistinct anteriorly. Posteriorly it crosses a large postero-dorsal swelling before being deflected downwards to join the posterior end of the ventral rib. The postero-dorsal swelling becomes increasingly prominent in younger instars whilst the median rib becomes less distinct. A low eye tubercle occurs antero-dorsally which is joined to the median rib by a low cross rib. Other cross ribs connect the median portions of the ventral and median ribs. A flattened shelf-like region occurs along the dorsal margin. Hinge crenulate merodont with a long straight median element.

*Remarks.* Chapman was in great confusion about this form figuring left valves, right valves, dimorphs, and instars as different species. He figured a right valve as *C. bicarinata* but a corresponding left valve was labelled *C. vellicata*. This confusion was perhaps brought about by the strong arching of the dorsal margin in the right valves as compared with the straight margin in the left valves. The increase in prominence of the postero-dorsal tubercle and decrease in prominence of the median rib during ontogeny led Chapman to figure juveniles as three further distinct types. As *C. bicarinata* Jones and Sherborn and *C. lonsdaleiana* Jones were misidentified by Chapman, *C. vellicata* is here proposed as the valid name for the species.

Chapman's material and the Compton material both come from the Upper Aptian Bargate beds and the author has obtained other specimens from a similar horizon in the Isle of Wight. Closely comparative forms such as *P. ornata* Kaye occur in the Hauterivian Tealby Limestone Series of Lincolnshire and the Lower Barremian portion of the

Speeton Clay. *P. ornata* differs principally from *P. vellicata* in the bifurcation of the median longitudinal rib anteriorly.

Family PROGONOCYTHERIDAE Sylvester-Bradley 1948

Genus NEOCYTHERE Mertens 1956

*Neocythere (N.) vanveeni* Mertens 1956

Plate 54, figs. 12, 13; Plate 55, fig. 13

- non 1849 *Cythere punctatula* var. *virginea* Jones, p. 12, pl. 1, fig. 2n.  
 non 1884 *Cythere subconcentrica* Jones, p. 768, pl. 34, figs. 28, 29.  
 non 1884 *Cythere drupacea* Jones, p. 772, pl. 34, fig. 30.  
 non 1890 *Cytheropteron concentricum* (Reuss) Jones and Hinde, p. 31, pl. 1, figs. 5–10; pl. 4, fig. 19.  
 1894 *Cytheropteron concentricum* (Reuss); Chapman, p. 691.  
 1894 *Cytheropteron concentricum* var. *virginea* Jones; Chapman, p. 691.  
 1894 *Cytheropteron subconcentricum* (Jones); Chapman, p. 691.  
 1894 *Cytheropteron drupaceum* (Jones); Chapman, p. 691.  
 1956 *Neocythere vanveeni* Mertens, p. 205, pl. 12, figs. 72–78; pl. 14, figs. 100–2.  
 1963 *Neocythere (N.) vanveeni* Mertens; Kaye, p. 276, pl. 41, figs. 23, 25.

*Material.* (i) S.M. B 28832, B 28840 (Chapman—*C. concentricum*) one from Littleton, one from Chilworth. (ii) S.M. B 28834 (Chapman—*C. subconcentrica*) from Littleton. (iii) S.M. B 28835 (Chapman—*C. drupaceum*) from Littleton. (iv) S.M. B 28833 (Chapman—*C. concentricum* var. *virginea*) from Littleton. (v) Five specimens from the author's collection B.M.N.H. Io1517–19, locality Compton.

*Remarks.* Most of Chapman's specimens of this species are juveniles and have been specifically differentiated largely on a basis of size. The degree of abrasion of the specimen also seems to have affected his terminology. The largest specimen, figured as *C. subconcentricum*, is refigured here (Pl. 55, fig. 13).

*Neocythere (Centrocythere) denticulata* Mertens 1956

1956 *Centrocythere denticulata* Mertens, p. 204, pl. 11, figs. 66–71; pl. 14, figs. 97, 99.

*Material.* Two specimens from the author's collection B.M.N.H. Io1520, locality Compton.

Genus ACROCYTHERE Neale 1960

*Acrocythere hauteriviana* (Bartenstein 1956)

*Remarks.* The specimen described by Chapman as *Cytheridea craticula* Jones and Sherborn (B 28830) is found to be a worn specimen of *Acrocythere hauteriviana*. No other material has been found from Compton or as yet from the Isle of Wight but it is found in the basal Aptian at Speeton.

Genus MACRODENTINA Martin 1940

? *Macrodentina* sp.

Plate 54, figs. 7, 10

*Material.* (i) A fragmentary valve B 28823 attributed by Chapman to *Cytheridea rotundata*, locality Littleton. (ii) Three specimens from the author's collection B.M.N.H. Io1509–11, locality Compton.

*Remarks.* Several poorly preserved specimens from Compton seem to belong within this genus. The characteristic ventral lineation and strong surface reticulation seem to fit well. Chapman's specimen attributed to *C. rotundata* though fragmentary also belongs within this category. It differs considerably from *C. rotundata* which itself has been noted (Kaye 1964) to be conspecific with *Schuleridea jonesiana* Bosquet. The specimen described by Jones (1849) as '*Cythere*' *bairdiana* and subsequently refigured (Kaye 1964, pl. 1, fig. 9) from the sponge gravels at Farringdon is also conspecific with this form and appears to be a juvenile. Its occurrence in the same zone of the Aptian at two different localities may contradict my earlier suggestion of derivation and it could possibly be indigenous. I have not been able to match the species with any published or unpublished British Upper Jurassic form. The juveniles which have the ventral lineation poorly developed are seen to have a strongly crenulate merodont hinge. The only adult specimen is, however, a closed carapace.

Family CYTHERIDEIDAE Sars 1925  
Genus CLITHROCYTHERIDEA Stephenson 1936

? *Clithrocytheridea* sp. (juv.)

*Remarks.* The specimen described by Chapman as *Cytheridea subperforata* Jones appears to be an early instar of a species of *Clithrocytheridea*. Two specimens are preserved, a left valve B 28822 and a right valve B 28840. The valves have the long margins converging strongly posteriorly. The lateral surfaces are finely pitted. The duplicature is very narrow; the hinge, however, has a median bar in the left valve and complementary furrow in the right. Low terminal elements are developed in the right valve.

The shape, small size, narrow duplicature, and poorly developed hinge seem to suggest that these specimens are only juveniles and until adult material is found the species cannot be described. The left valve comes from Littleton, the right valve was found at St. Martha's Hill.

The specimen figured as *Cytheridea bipapillata* by Chapman probably should also belong here. This species B 28831 is so broken as to be valueless. Only a portion of the margin preserved is the anterior where the narrow duplicature and short radial pore canals point to it being a pre-adult form. The strongly punctate surface is the only definite recognizable feature. Unfortunately no comparative material of these forms has been found from Compton.

Family PROTOCYTHERIDAE Mandelstam 1960  
Genus PROTOCYTHERE Triebel 1938

*Protocythere inornata* sp. nov.

Plate 55, figs. 19-21

*Material.* (i) Holotype a female left valve B.M.N.H. Io1526 from the Bargate beds at Compton.  
(ii) Four paratypes B.M.N.H. Io1527-31 from the same sample.

*Diagnosis.* An inflated species of *Protocythere* with rather subdued ornament compared to other members of the genus. The median longitudinal rib runs somewhat obliquely across the lateral surface.

*Measurements.*

Holotype, female L.V., B.M.N.H. Io1526,	length 0.79 mm.,	height 0.46 mm.
Paratype, female R.V., B.M.N.H. Io1528	„ 0.79 mm.	„ 0.42 mm.
Male carapace, B.M.N.H. Io1527	„ 0.85 mm.	„ 0.45 mm.

*Description.* Valves elongate strongly built. Dorsal and ventral margins straight and subparallel. Prominent anterior and more subdued posterior hinge ears present in the left valves. Lateral surface somewhat inflated and bearing three poorly developed longitudinal ribs. The dorsal rib is least distinct and is separate both anteriorly and posteriorly. The median rib runs somewhat obliquely across the lateral surface being nearer the dorsal margin posteriorly; anteriorly it is joined to a low smooth muscle node. The ventral rib is most prominent becoming more inflated posteriorly; it is separated from the margin anteriorly by a flattened shelf but runs to meet it posteriorly. An inflated rib follows the anterior margin, being joined dorsally to a low eye tubercle set some distance from the margin. The anterior margin and lower half of the posterior margin bear a series of tubercles. The intercostal and marginal areas are smooth. The hinge is strongly crenulate merodont, having in the right valve two high strongly divided terminal teeth decreasing in size towards the median element, which is a locellate, almost interoculate, furrow. The anterior hinge ear in the left valve makes a prominent prolongation anterior to the terminal socket.

*Remarks.* This species is most similar to *P. hechti* Triebel but differs in the greater lateral inflation, subdued ribbing and the oblique path of the median rib. A strongly related but as yet undescribed form, which however, lacks the anterior marginal rib and tuberculation, occurs in the Tealby Limestone Series of Lincolnshire.

## Genus VEENIA Butler and Jones 1957

*Veenia robusta* sp. nov.

Plate 54, figs. 2, 4, 5

*Material.* (i) Holotype a female left valve B.M.N.H. Io1501 from the Bargate beds at Compton. (ii) Four paratypes from the same sample B.M.N.H. Io1502-5.

*Diagnosis.* A large robust species of *Veenia* with large reticulations over the whole of the lateral surface. The anterior marginal area is crossed by a series of short irregular ridges.

*Measurements.*

Female L.V., holotype B.M.N.H. Io1501,	length 0.97 mm.,	height 0.52 mm.
Female R.V., B.M.N.H. Io1503	„ 0.95 mm.	„ 0.50 mm.
Male carapace, B.M.N.H. Io1502	„ 1.12 mm.	„ 0.55 mm.

*Description.* Valves large, strongly built. Dorsal and ventral margins straight and subparallel. Marked anterior and posterior hinge ears occur in the left valves. Lateral surface crossed by three subparallel longitudinal ribs. The dorsal rib obscures the central part of the hinge margin and is separate both anteriorly and posteriorly. The median rib is shorter and is joined anteriorly to a large elongate muscle node. There is, however,